WE CLAIM:

1. A method for selecting a modulation configuration in a multi-carrier modulation system that supports a plurality of modulation configurations, comprising steps of:

   for each modulation configuration m, determining a number of sub-carriers k_m having a signal-to-noise ratio above a predefined threshold $_m$; computing a number of useful sub-carriers n_m by dividing k_m by a predefined ratio r_m; constructing a sub-set of sub-carriers by selecting n_m sub-carriers having the highest signal-to-noise ratio; and, computing a throughput t_m, by multiplying n_m by a predefined capacity c_m per sub-carrier; and

   selecting the modulation configuration having the highest throughput.

2. A method as claimed in claim 1, wherein the step of computing a number of useful sub-carriers further comprises a step of ensuring that the number of useful sub-carriers is an integer value not greater than n.

3. A method as claimed in claim 2 wherein the step of ensuring is performed using the equation:

$n_m = \min(n, \text{floor}(k_m/r_m))$.

4. A method as claimed in claim 1, wherein the predefined threshold $_{m}$ is selected using empirical data derived from simulation results.

5. A method as claimed in claim 1, wherein the predefined ratio r_m is selected using empirical data derived from simulation results.

6. A method as claimed in claim 5 wherein the ratio r_m is selected to leverage the corrective power of forward error correction associated with the modulation configuration.

7. An apparatus for selecting a modulation configuration, in a multi-carrier modulation system that supports a plurality of modulation configurations, comprising:

means for determining a number of sub-carriers k_m having a signal-to-noise ratio above a predefined threshold $_{m}$, for each modulation configuration m;

means for computing a number of useful sub-carriers n_m for each modulation configuration m, by dividing k_m by a predefined ratio r_m;

means for constructing a sub-set of sub-carriers by selecting n_m sub-carriers having the highest signal-to-noise ratio for each modulation configuration m;

means for computing a throughput t_m, for each modulation configuration m, by multiplying n_m by a predefined capacity c_m per sub-carrier; and

means for selecting the modulation configuration having the highest throughput.

8. An apparatus as claimed in claim 7, wherein the means for computing a number of useful sub-carriers further comprises means for ensuring that the number of useful sub-carriers is an integer value not greater than n.

9. A method for selecting sub-carriers in a modulation system, comprising steps of:

selecting a first sub-set of sub-carriers k having a signal-to-noise ratio that exceeds a predetermined threshold;

dividing k by a predetermined ratio r to derive a number of sub-carriers to include in a second, larger sub-set of sub-carriers;

selecting the second sub-set of sub-carriers by selecting n sub-carriers having a highest signal-to-noise ratio; and

using the n sub-carriers for data transmission in the modulation system, whereby the predetermined ratio r is selected to leverage the corrective capacity of a forward error correction used in the modulation system to improve data throughput.

10. A method as claimed in claim 9 wherein the modulation system is a multi-carrier modulation system that supports a plurality m of modulation configurations, and the method further comprises steps of:

performing the steps of selecting the first sub-set, dividing and selecting the second sub-set for each of the modulation configurations *m*;

computing a throughput t_m, for each modulation configuration *m*, by multiplying n_m by a predefined capacity c_m per sub-carrier of each second sub-set of sub-carriers; and

using the modulation configuration having the highest throughput.

11. A power network interface (PNI) for connecting an electronic device to a power line network, comprising:

a sub-carrier map selector adapted to receive a signal-to-noise ratio (SNR_i) for each of a plurality of sub-carriers *i*, i=1,2,…,n; to select a first sub-set of sub-carriers *k*; and, to divide *k* by a predetermined ratio *r* to derive a second, larger sub-set *n* of sub-carriers for use by the PNI for the transfer of data over the power line network, whereby *r* is selected to leverage the corrective capacity of forward error correction associated with a modulation configuration used by the PNI to transmit data over the power line network.

12. A power network interface as claimed in claim 11 wherein the sub-carrier map selector is further adapted to derive the second, larger sub-set *n* of sub-carriers for each of a plurality of modulation configurations *m* that may be used by the PNI to transfer data over the power line network.

13. A power network interface as claimed in claim 11 wherein the sub-carrier map selector is further adapted to compute a throughput t_m, for each of the modulation configurations m, by multiplying n_m by a predefined capacity c_m per sub-carrier of each second sub-set of sub-carriers n.

14. A power network interface as claimed in claim 13 wherein the sub-carrier map selector is further adapted to select one of the modulation configurations m having a highest throughput t_m for use by the PNI for the transfer of data over the power line network.

15. A power network interface as claimed in claim 11 wherein the power line network is a home power line network.